# Ny-Ålesund Observatory: What Has Been Done?

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**Abstract** The existing 20-m radio telescope in Ny-Ålesund was put into operation in 1994. The telescope is more than 20 years old now and is ready for retirement. We decided to build a VGOS core site with twin telescopes. The existing telescope is just 70 meters away from the airport runway and the CAA did not allow us to build anything new as close. The new site is about 1,500 meters northwest of the old telescope and we had to build a road with a bridge. This was finished in summer 2014 and the construction work at the new site started in October 2014. It is challenging to do construction work during the winter time at 79°N with permafrost. During the winter, the VLBI foundation was built. The station, SLR, and gravity buildings were built as well. This presentation will show what has been done until now and different solutions for the telescopes. The telescopes are scheduled to arrive in April 2016.

**Keywords** Radio telescope, VGOS

## 1 Introduction

We started in 2013 and built the first part of the road and a bridge. The rest was completed in 2014 and Veidekke started the construction work at the new site in October 2014. One year later all of the buildings have finished construction.

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## 2 Construction Work

First we had to dig the holes for the VLBI foundation. We found bed rock in a depth of four meters. This was just as test drillings had indicated. After cleaning the bedrock with steam everything was ready for the concrete. We built the VLBI, SLR, and gravity foundations. During winter time you have to use tents and heat where you will do concrete work. This created some extra work and during winter storms it was rather difficult. All houses are made of wood and stand on steel pipes (120 of them) drilled down one meter into bedrock.

## 3 Control Points and GNSS

At the site we established several control points and three GNSS points. The latter are made like a tripod with steel pipes drilled one meter down into bedrock and welded together at the top. A steel tower will be put on the tripod.

## 4 Telescopes

The first FAT was done in October 2015 and the second in January 2016. The telescopes are ready for shipment and will arrive in Ny-Ålesund at the beginning of April 2016. The telescopes have everything inside. This will keep all instruments and cables at controlled temperatures. We have also made a temperature controlled box for the VLBI signal cables in the walk ways. The front end will use a trolley and a railway will be made in the

**Fig. 1** Site overview in February 2015.

**Fig. 2** The station in late summer 2015.

feed cone. When the front end must be taken down for maintenance, the railway can be extended and a hoist on the azimuth cabin can lift the trolley down. The telescopes have an invar wire system and tiltmeters.

## 5 Other Things

The Maser will arrive in July 2016. We have not decided yet what feed to use but will do so in spring

**Fig. 3** First telescope at FAT.

2016. GNSS was up and running in November 2015. The SLR system will come in 2019. For more information, please visit Veidekke's Web page: http://veidekkearctic.no.